

CLAIMS

1. An arc tube having a glass tube that is wound into a spiral, wherein

the glass tube has an inner shape of a substantially circular cross section, with an inner tube diameter in a range of 5 mm to 9 mm inclusive, and

a bulb wall loading is set so that a temperature of a coldest spot within the glass tube under steady state illumination falls into a range of 60 °C to 65 °C inclusive.

2. An arc tube having a glass tube that is wound into a spiral, wherein

the glass tube has an inner shape of a substantially elliptical cross section, with an inner tube major axis in a range of 5 mm to 9 mm inclusive and an inner tube minor axis of 3 mm or larger,

a bulb wall loading is set so that a temperature of a coldest spot within the glass tube under steady state illumination falls into a range of 60 °C to 65 °C inclusive.

3. The arc tube of Claim 1, wherein

the bulb wall loading is set within a range of 0.08 W/cm² to 0.12 W/cm² inclusive.

4. The arc tube of Claim 1, wherein

the glass tube is in a shape of double-spiral comprising a turning part, a first spiral part, and a second spiral part, the turning part being located in substantially a midsection of the glass tube, the first spiral part starting from one end of the glass tube and spiraling around a pivotal axis to reach the turning part, the second spiral part starting from the turning part and spiraling around the pivotal axis to the other end of the glass tube.

5. The arc tube of Claim 3, wherein

the glass tube is in a shape of a double-spiral comprising a turning part, a first spiral part, and a second spiral part, the turning part being located in substantially a midsection of the glass tube, the first spiral part starting from one end of the glass tube and spiraling around a pivotal axis to reach the turning part, the second spiral part starting from the turning part and spiraling around the pivotal axis to the other end of the glass tube.

Amendment of the Claims

[Received by the International Bureau on May 27, 2003:
original Claim 6 has been amended; new Claim 7 has been added;
5 and original Claim 7 has been amended and renumbered as Claim
8 (1 page)]

6. (amended) The arc tube of Claim 5, wherein
the glass tube is formed so as to fit into a
10 cylindrical space of maximum diameter in a range of 30
to 40 mm inclusive and maximum length in a range of 50
to 100 mm inclusive.

15 7. (added) The arc tube as recited in one of Claims 1 to
6, wherein
elemental mercury is sealed within the glass tube.

20 8. (amended) A low-pressure mercury lamp that includes
the arc tube as recited in one of Claims 1 to 7.